Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary

NEWSLETTER

December 1990

Readers are encouraged to submit brief articles or ideas for articles. Correspondence, including requests for changes in the mailing list, should be addressed to Randy Brown, California Department of Water Resources, 3251 S Street, Sacramento, CA 95816.

WESTERN SUISUN MARSH SALINITY CONTROL PROJECT

DWR and USBR will soon be preparing an EIS/EIR for a Western Suisun Marsh Salinity Control Project. The proposed project covers the third and fourth phases of the Plan of Protection for Suisun Marsh – Boynton-Cordelia ditch, Cordelia-Goodyear ditch, and Goodyear Slough culverts.

In November 1990, the Notice of Intent was published in the Federal Register and the Notice of Preparation was distributed. A public scoping session was held in Fairfield on December 13 to enable public input on the scope and issues. The Draft EIS/EIR is scheduled to be available for review by November 1991.

A Plan to Protect Suisun Marsh

Suisun Marsh is in southern Solano County, west of the Delta and north of Suisun Bay. The marsh represents over 10 percent of California's remaining natural wetlands and is one of the largest contiguous brackish water tidal marshes in the United States. It covers about 55,000 acres of wetlands and 29,000 acres of bays and sloughs.

In 1974, the California Legislature enacted the Suisun Marsh Preservation Act (SB 1981), requiring development of a protection plan for the marsh. In 1978, SWRCB issued Water Right Decision 1485, establishing channel water salinity standards to provide optimum habitat for waterfowl food plant production and to preserve Suisun Marsh as a brackish water tidal marsh. Decision 1485 established conditions for the CVP and SWP water right permits. Order 7 of Decision 1485 required that DWR and USBR develop and implement a plan, in cooperation with other agencies, to ensure that channel salinity standards are met.

In 1984, DWR published the *Plan of Protection for the Suisun Marsh including Environmental Impact Report*, prepared in cooperation with DFG, USBR, and Suisun Resource Conservation District. USFWS also provided information. The Plan of Protection is a proposal for staged implementation of monitoring, a wetlands management program for landowners, physical facilities, and supplemental releases of water from CVP and SWP reservoirs. Components already completed are the Morrow Island distribution system, Roaring River distribution system, Goodyear Slough outfall, and Suisun Marsh Salinity Control Gates (sometimes called Montezuma Slough control structure). Yet to be completed are Boynton-Cordelia ditch, Cordelia-Goodyear ditch, Goodyear Slough culverts, Grizzly Island distribution system, and Potrero Hills ditch. The map on page 2 shows the facilities.

Because of the staged implementation, DWR prepared a "program EIR" for the Plan of Protection. The EIR covers the actions and their impacts in varying degrees of detail, based on the best available information at the time of preparation. It was intended that while planning subsequent actions, the lead agency would prepare supplemental documentation if new significant impacts were identified.

In 1986, federal legislation (PL 99-546) authorized funds to USBR for protecting Suisun Marsh. In 1987, USBR, DWR, DFG, and Suisun Resource Conservation District signed the Suisun Marsh Preservation Agreement. All future activities will comply with both NEPA and CEQA regulations.

Boynton-Cordelia Ditch

Boynton-Cordelia ditch, planned for the northwestern portion of Suisun Marsh, is scheduled for operation by October 1994. The ditch would use the tide to move lower salinity water from the eastern part of the marsh toward the west through Boynton Slough and an earthen ditch about 3.5 miles long to Cordelia Slough. Important features of the proposed ditch are:

- If necessary, Boynton Slough would be enlarged from the Southern Pacific Railroad to its western end (about 3,500 feet) to deliver about 200 cfs over a tidal cycle.
- The eastern segment of Boynton-Cordelia Ditch would be constructed from the western end of Boynton Slough to inlet culverts about 2,600 feet north.

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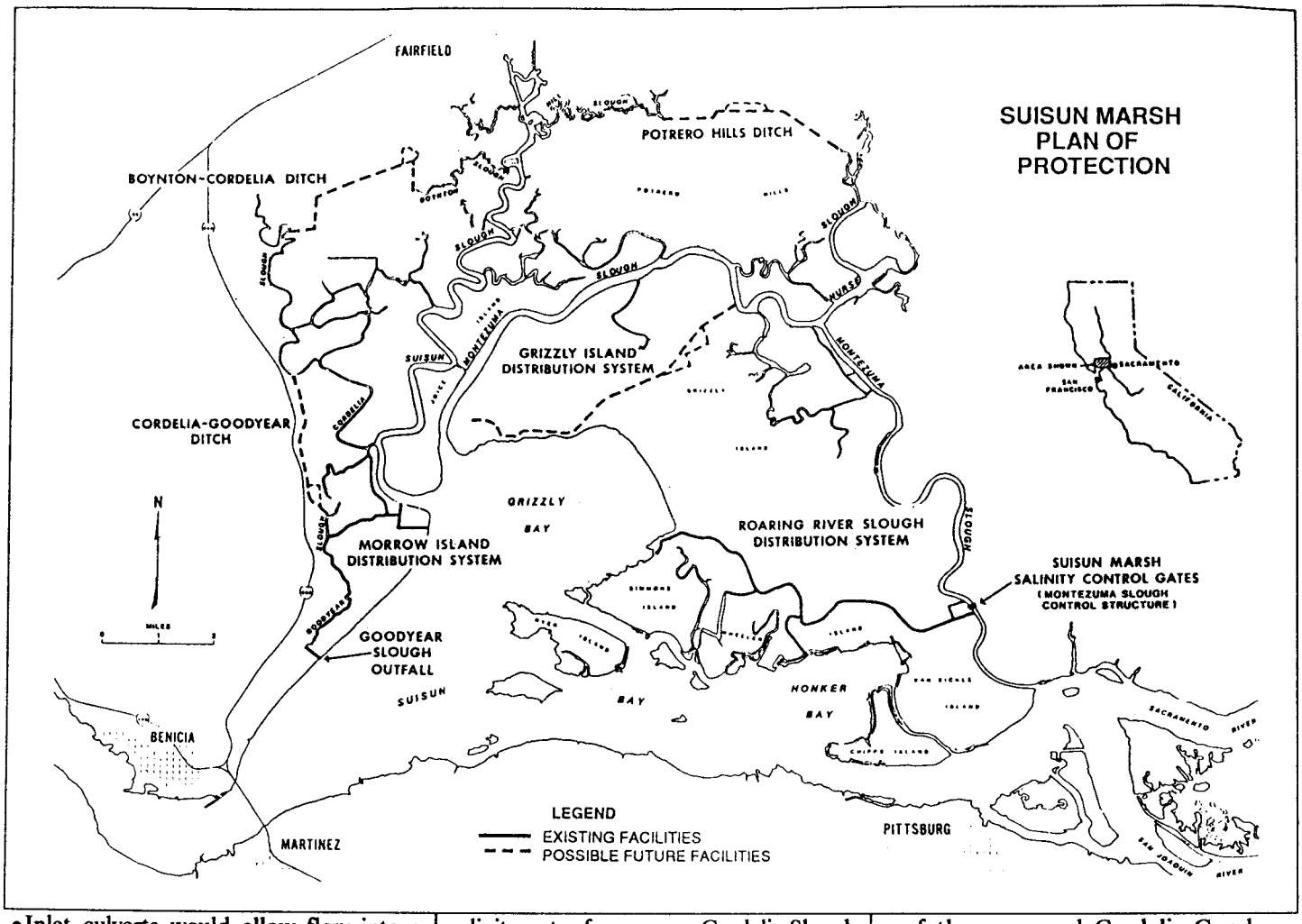

- Inlet culverts would allow flow into a holding pond constructed south of the Fairfield-Suisun Wastewater Treatment Plant. The pond would also receive about 40 cfs of tertiary treated freshwater effluent from the treatment plant.
- Water from the pond would flow by gravity westward to outlet culverts on Cordelia Slough through the remaining 3-mile segment of Boynton-Cordelia Ditch.
- A siphon would be built to move water from east to west beneath Suisun Creek near Chadbourne Slough.
- If necessary, Cordelia Slough would be enlarged to accommodate the additional flow.
- A ditch belonging to Reclamation District 2034 would be relocated to just north of the Boynton-Cordelia Ditch.
- Public recreation facilities are proposed at the pond.

Cordelia-Goodyear Ditch

Cordelia-Goodyear Ditch, planned for the western portion of Suisun Marsh, is scheduled for operation by October 1995. The ditch would use the tide to move lower salinity water from upper Cordelia Slough (near the Ibis Club) through an earthen ditch about 2.8 miles long to Goodyear Slough about a half-mile north of the intake to the Morrow Island distribution system. Main features of the proposed Cordelia-Goodyear Ditch are:

- The ditch would run parallel to the eastern side of Interstate 680 and would deliver about 160 cfs over a tidal cycle from inlet culverts on Cordelia Slough to outlet culverts on Goodyear Slough.
- A pond would be constructed on the Goodyear Slough end of the ditch to increase its holding capacity and provide for public recreation facilities.

Goodyear Slough Culverts

The Goodyear Slough culverts are planned for the southwestern portion of Suisun Marsh and are scheduled for operation by October 1995. The culverts would be operated only when required to reduce salinity in Goodyear Slough. The culverts include the following features:

- Culverts would be placed across Goodyear Slough on the Grizzly Bay side of the proposed Cordelia-Goodyear Ditch outlet.
- When operating, the culverts would cause northerly flow from Goodyear Slough toward Suisun Slough and prevent inflow of higher salinity water from Suisun Slough into Goodyear Slough.
- The culverts would have flap gates on the Grizzly Bay ends and vertical slide gates on the Goodyear Slough ends.
- The culverts would be opened to allow flow in both directions from July through September and during high runoff.

Alternative Actions

The EIS/EIR will include assessments of Boynton-Cordelia Ditch, Cordelia-Goodyear Ditch, and the Goodyear Slough culverts. Several alternative actions will also be assessed, including the "no action" alternative of using existing CVP and SWP facilities and operations in Suisun Marsh and the Delta to meet future water needs. Other alternatives include but are not limited to:

- Obtaining additional water from creeks north of Suisun Marsh;

- Constructing a water delivery ditch from Suisun Slough to Cordelia Slough via Frank Horan Slough;
- Improving the water delivery capacity of Cutoff Slough and Volanti Slough;
- Installing tidal gates on Goodyear Slough at Suisun Slough; and
- Releasing additional water from CVP and SWP reservoirs.

Environmental Assessment

The EIS/EIR will address various environmental impacts; both positive and adverse impacts will be determined, and mitigation measures will be proposed for adverse impacts. Cumulative impacts on the Suisun Marsh and Suisun Bay area will be assessed with respect to existing marsh facilities and the other facilities proposed in the Plan of Protection. The following and any other environmental concerns identified will be addressed:

- Surveys will be conducted for threatened and endangered plants and wildlife, and archaeological sites.
- Habitat of marsh flora along the ditch alignments, ponds, and culverts would be disturbed. According to the 1987 Suisun Marsh Mitigation Agreement signed by USBR, DWR, and DFG, converted wetland habitat would be reestablished elsewhere in the marsh.
- Wildlife habitat and wildlife movement corridors could be impacted by enlargement of natural channels; the constructed ditches, ponds, and culverts; and dredge spoils.
- Resident and migratory fish could be impacted by the movement of water from Boynton Slough to Cordelia Slough and from Cordelia Slough to Goodyear Slough, as well as by water transport through ponds, culverts, and siphons.
- Natural channels near the ditches and culverts will be checked for scour and/or siltation resulting from altered velocities.

Because some areas included in the Western Suisun Marsh Salinity Control Project are wetlands, objectives and requirements of Presidential Orders 11988 and 11990 will be considered throughout the planning and preparation of the EIS/EIR.

Before construction and operation of Boynton-Cordelia Ditch, Cordelia-Goodyear Ditch, Goodyear Slough culverts, or any alternative actions, USBR and DWR will have to obtain permits from USACE, DFG, San Francisco Bay Conservation and Development Commission, San Francisco Regional Water Quality Control Board, and California State Lands Commission. These and other agencies will help evaluate the EIS/EIR to ensure that it complies with requirements of NEPA and CEQA.

Public Input

Suisun Marsh Technical Advisory Committee meetings will be a forum for public and agency input to the EIS/EIR. Meetings are scheduled for 9:30 a.m. on the last Thursday of each month at the DWR Central District Office, 3251 S Street, Sacramento (large conference room). To receive meeting announcements, agendas, and minutes, contact Kamyar Guivetchi at 916/445-7094.

If you have questions, comments, or suggestions, please contact:

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  Phone 916/323-8888, FAX 916/322-7184
- Rick Breitenbach
  U.S. Bureau of Reclamation
  2800 Cottage Way, Room W-2103
  Sacramento, CA 95825.
  Phone 916/978-5134, FAX 916/978-5284

Kamyar Guivetchi (DWR)

NOTEWORTHY

- Limited numbers of the 1989 Annual Report for the Interagency Ecological Studies Program are now available. Call 916/323-7203.
- Wim Kimmerer of Biosystems recently submitted a draft report, "An Evaluation of Existing Data in the Entrapment Zone of the Sacramento-San Joaquin Estuary", to the Interagency Food Chain Group for review. The report is expected to be released early in 1991.
- Don Kelley, Bill Mitchell, and Sheila Greene distributed a draft report, "Estimating the Effect of Changing Delta Environmental Conditions on Sacramento Basin Fall-Run Chinook Salmon" for review by the 5-Agency salmon teams . The report describes an evaluation tool linking the Kjelson/Mitchell/Greene Delta smolt survival model with project operation and Sacramento River temperature models. The goal is to have this tool available for the scoping phase of the Bay/Delta hearings.

INTERAGENCY WORKSHOP

The 1991 annual Interagency workshop is scheduled for February 20-22 at Asilomar Conference Center. Agency staff, agency consultants, and speakers have taken all the rooms reserved at Asilomar. Those not with the Interagency Program who want to attend must find their own lodging and pay a $6.00 per day Asilomar use fee and $20.00 registration fee. A few meal tickets are still available from the Conference Center.

The annual workshop is a time for staff from the cooperating agencies to discuss findings and problems in an informal setting, but the Agency Coordinators know there is also considerable interest in study direction and results by those outside the program. Therefore, to facilitate exchange between staff and others, the Interagency Program will be holding a public meeting *(Constituent Forum)* at the Contra Costa Water District office the last week in March. If you have suggestions for the agenda, please contact Perry Herrgesell (209/446-4421). The meeting announcement and agenda will be mailed in late February to those on the *Newsletter* mailing list and to representatives of the Estuary Project's Management Committee.

HYDRODYNAMIC INVESTIGATION OF CARQUINEZ STRAIT

This winter USGS, with assistance from DWR and USBR, is collecting field data and using a 3-dimensional model to study hydrodynamics in Carquinez Strait.

During early December, an ADCP *(Acoustic Doppler Current Profiler)* and two arrays of current meters were deployed on a cross section just downstream of Dillon Point. The instruments will stay in the water continuously until mid-March, except for a brief retrieval/redeployment period in late January.

Also in December, a boat was used to collect salinity and temperature profiles to help define initial conditions for application of the 3-dimensional model. Salinity profiling will also be conducted several more times during the 3-month study to define the variation in salinity structure between spring and neap tides and during any times of higher-than-normal Delta outflow. Boundary conditions for the model will be taken from data collected at the Martinez and Selby shore monitoring stations. USGS will also estimate discharge at the cross section several times with its vessel-mounted ADCP system.

Carquinez Strait was chosen for study because the geometry is relatively simple compared with other places in the bay, simplifying quantification of hydrodynamic phenomena. Also, Carquinez Strait is hydrodynamically important in the system. If flows are moderately high, it is likely the null zone will be positioned within Carquinez Strait. If so, a fine-grid 3-dimensional model can be used to simulate the distribution of currents in the null zone. If flows are low, the gravitational circulation and mechanisms controlling salinity stratification can still be studied. The detailed field measurements will also provide a rigorous test case for a 3-dimensional model that should help us better understand vertical mixing processes and foster eventual application of a 3-dimensional model to the entire bay system.

A further objective of the study is to quantify net Delta outflow. This should be possible by coupling measurements with modeling. If measured currents are not of sufficient resolution to compute flows, the model can be used to fill in the needed information. A reasonably precise estimate of net flows through the Strait is important for future hydrodynamic studies in the San Francisco Bay system.

Peter Smith (USGS)

STAFF NOTES

- Perry Herrgesell was promoted to Program Manager and formally took over as Interagency Study manager.
- Dennis McEwan, Fishery Biologist working on fish salvage operations at DFG-Stockton, recently completed his MS at CSU-Sacramento. His thesis was on the Owens tui chub in the Hot Creek drainage. Dennis has since accepted a transfer to the Inland Fisheries Division, where he will be working on the agricultural diversion screening program.
- Bob Kano, Fishery Biologist with DFG's Delta Fish Facilities study, has also accepted a transfer to the Inland Fisheries Division. He is now stationed at Rio Vista, where he is working on the Sacramento River creel census.

SUISUN MARSH SALINITY CONTROL GATES

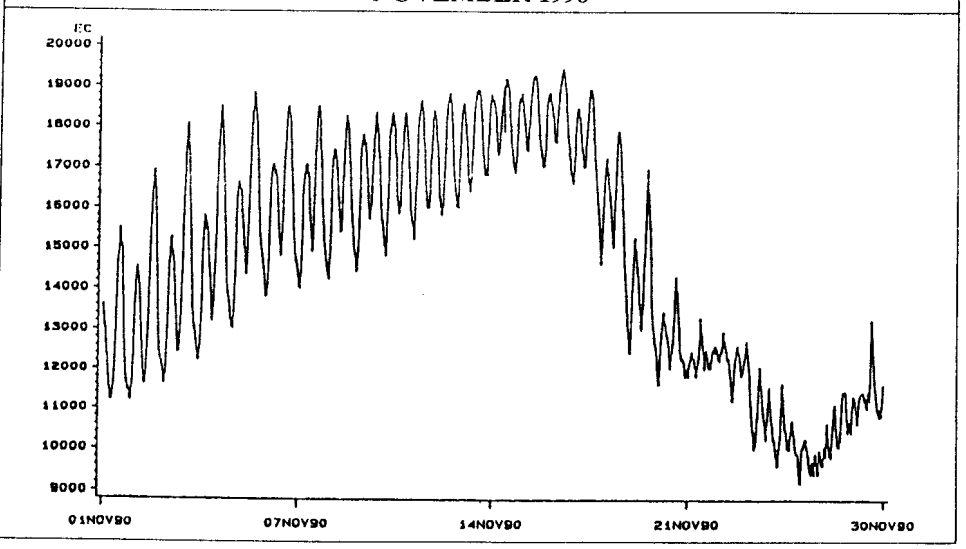
The Suisun Marsh Salinity Control Gates, at the eastern end of Montezuma Slough, are used to tidally pump good quality (low salinity) water into the interior marsh. On October 30, the center of the three gates failed during operation and fell to the closed position. Examination showed that a stainless steel shackle, which attaches the operating cables to the gate, had failed. The other two gates were also closed until their shackles could be examined.

As shown in the figure, salinity at an interior monitoring site at Beldons Landing rose steadily until full gate operation was resumed on November 18. Salinity decreased sharply until November 28, when the flashboards (a moveable barrier next to the gates and boat lock) were removed to allow a barge into the marsh for emergency levee repair. The flashboards were reinstalled on December 5.

The gate failure resulted in an end-of-month (running average) specific conductance of 15.6 millisiemens at Beldons Landing, slightly above the 15.5 millisiemen standard for November.

Randy Brown (DWR)

SPECIFIC CONDUCTANCE AT BELDONS LANDING, NOVEMBER 1990



Unit of the Month – USGS HYDRODYNAMICS PROJECT

The USGS Hydrodynamics Project has been part of the Interagency Program since 1985. The project is jointly funded by USGS, SWRCB, and DWR. USBR and USACE have also provided funds for equipment. The March Newsletter will have a full description of the Hydrodynamics Project. In the meantime, meet our staff.

- Jon Burau, hydrologist, has been part of the project since 1985. He received a BS in civil engineering from UC-Davis in 1984 and is now pursuing a PhD at Stanford. Jon has developed the whole-bay spectral model, hydrodynamics and bathymetric data bases for San Francisco Bay, and graphical model development and animation programs.
- Rick Oltmann, hydrologist, has a BS in civil engineering from CSU-Sacramento (1971). He has been with USGS since 1970, with the hydrodynamics project since 1984, and chair of the Interagency Hydrodynamics Subcommittee from December 1985 to March 1990. Rick's primary responsibility with the project is planning and coordinating data collection using the ADCP systems, CTD, and *in situ* current meters. Rick oversees operation of the USGS continuous monitoring water level, salinity, flow (Delta AVMs) , and meteorological stations in the bay and Delta, and is manager of the hydrodynamics data base. Rick has also been working on application and calibration of a 1-dimensional flow model.
- Larry Smith, hydrologist, earned BS and MS degrees in applied mathematics from North Carolina State University in 1970 and 1972, and has worked for USGS since. In 1978, he spent a year at the Institute of Animal Resource Ecology, University of British Columbia, in graduate study with USGS sponsorship. He has been part of the hydrodynamics project since it began, and is now chair of the Interagency Hydrodynamics Committee. Larry's main technical duties include 2-dimensional modeling and time-series analysis of bay physical data.
- Pete Smith, hydrologist, is responsible for 3-dimensional model applications and development. He has worked for USGS more than 14 years; previously in New York and Mississippi. Pete has a BS in civil engineering from Villanova University and an MS from Colorado State University. He is working toward a PhD at UC-Davis.
- Steve Gallanthine, hydrologist, has a BS in earth science from CSU-Hayward. Before transferring to the Water Resources Division in 1985, Steve worked for the Geologic Division. He has been on the bay hydrodynamics staff since 1988, and is chief of the operation of the central Delta AVMs, in addition to other data collection and processing tasks.
- Rick Adorador, hydrologic technician, has an AA in forest technology from Sierra College. He has been with USGS since 1973. Rick is operator of the 33-foot research vessel *Rantz*, and he also helps with data collection and processing.

FISH FACILITIES

The Fish Facilities Technical Committee met December 6 to discuss the types of activities to be included in the program. Representatives of NMFS, USFWS, USBR, DWR, and DFG agreed to continue participation on the committee. Dan Odenweller, DFG, will remain as chair.

Activities to be included in the program are:

- Evaluation of fish losses in Clifton Court Forebay, including such means to reduce losses as predator control.
- Evaluation of fisheries impacts of such facilities as the proposed southern Delta barriers.
- Studies associated with new diversions off the Sacramento River, such as enlarging Delta Cross Channel or constructing a New Hope Channel.

Beginning in July 1991, under contract to DWR, DFG will assume operation of fish salvage, counting, and hauling at the Skinner Fish Facilities at the SWP intake. This change, which will increase sampling, should result in more accurate estimates of numbers of salvaged fish.

SAN FRANCISCO BAY ELEMENT

On December 18, 1990, the agency coordinators agreed to postpone restructuring the Bay Program Element for a year. The decision will allow staff sorely needed office time to complete analyses of the first 10 years of data before making major program changes. The results of these analyses will be made available in a DFG Fish Bulletin now expected to be published in late 1991. During the upcoming year, staff will continue a reduced fish monitoring program from February to September to follow effects of the prolonged drought on the fisheries.

The first meeting of the Bay Study's review panel has been postponed. The meeting was originally scheduled for February 5 and 6. The panel is now expected to meet twice in 1991 (spring and fall) to help staff develop recommendations for any needed program changes.

Members of the review panel are:

Jerry Schubel, State University of New York at Stoneybrook
Bill Bolcourt, University of Maryland
Donald O'Connor, Manhattan College
Carl Walters, University of British Columbia
Tim Hollibaugh, Tiburon Center
Alex McCall, National Marine Fisheries Service

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A Cooperative Effort of:

California Department of Water Resources
State Water Resources Control Board
U.S. Bureau of Reclamation
U.S. Army Corps of Engineers
California Department of Fish and Game
U.S. Fish and Wildlife Service
U.S. Geological Survey

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